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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

FEELY, MICHAEL J

ART UNIT

PAPER NUMBER

1712

DATE MAILED: 04/09/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/035,168

Applicant(s)

STANDKE ET AL.

Examiner

Michael J Feely

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-19 is/are rejected.
- 7) ☒ Claim(s) 3 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claim 10 is objected to because of the following informalities: the phrase, "wherein the organofunctional is heat treated" appears to be missing a word. The claim should read -wherein the organofunctional substrate is heat treated-. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 6 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "wherein the acid or base" in the process of claim 4. There is insufficient antecedent basis for this limitation in the claim. This claim should be depended upon claim 5.

- Claim 7 recites the limitation "wherein the free radical generator" in the process of claim 4. There is insufficient antecedent basis for this limitation in the claim. This claim should be depended upon claim 5.

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Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

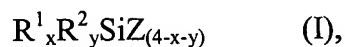
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 4, 8, and 13-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Ogawa et al. (US Pat. No. 5,225,274).

Regarding claims 1, 4, 8, and 13-18, Ogawa et al. disclose: *(1)* a process for modifying the surface of an organofunctional substrate comprising reacting an organofunctional group of a silicon compound A with the surface of an organofunctional substrate to form a polar treated surface (column 4, lines 12-16 and 24-53), wherein the silicon compound A comprises at least one organofunctional group at one end and at least one chloro, alkoxy, carboxy or hydroxyl group, and further wherein said silicon compound A may react to form a polymer bearing silyl groups (column 4, lines 37-47); then applying to the polar treated surface an organofunctional silicon compound B (column 5, lines 8-22 and 35-55), wherein the silicon compound A and B may be identical or different, the silicon compound B bears at least one chloro, alkoxy, carboxy, or hydroxyl group, and the silicon compound B reacts with the polar treated surface (column 5, lines 35-55); *(4)* wherein the organofunctional group of the silicon compound A is linear, branched or cyclic alkyl group having from 1 to 20 carbon atoms and may optionally be substituted with a halogen or an alkenyl group having from 2 to 16 carbon atoms (column 4, lines 37-47); *(8)* wherein the method used to apply the silicon compound B is selected from the group consisting of spraying, dipping, drenching, brushing, polishing, rolling, doctoring, CVD, and

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PVD (column 9, lines 5-7); **(13)** wherein one or both of the silicon compounds A and B is an organosilane of the general formula I



wherein the groups R^1 and R^2 are identical or different, and each is linear, branched, or cyclic alkyl group having from 1 to 20 carbon atoms, or ω -chloroalkyl, ω -bromoalkyl, ω -azidoalkyl, ω -cyanoalkyl, ω -isocyanatoalkyl, fluoroalkyl, perfluoroalkyl, alkenyl, aryl, ω -acryloxyalkyl, ω -methacryloxy alkyl, sulfane, ω -mercaptoalkyl, sulfoxyalkyl, ω -thiocyanatoalkyl, ω -glycidylloxyalkyl, epoxy alkyl, alkenyloxyalkyl, alkoxyalkyl, hydroxyalkyl, aminoalkyl, carbonatoalkyl, or a ureidoalkyl group, wherein each alkylene group contains from 1 to 6 carbon atoms, Z is chloro, a methoxy, ethoxy, isopropyl, 2-methoxyethoxy or acetoxy group, and x is 1, 2, or 3, and y is 0, 1, or 2, and $(x+y) \leq 3$, or an organosiloxane based on at least one organosilane of the general formula 1, or a mixture of said organofunctional compound (column 4, lines 37-47; column 5, lines 35-55); **(14)** wherein one or both of silicon compounds A and B is present in monomeric, oligomeric, cocondensed, dissolved, emulsified, or suspended form (column 4, lines 37-47; column 5, lines 35-55); **(15)** wherein the organofunctional substrate comprises a plastic, a composition, or a natural substance (column 6, lines 4-8); **(16)** wherein the organofunctional substrate is selected from the group consisting of polyethylene, polypropylene, polyamide, polyester, polyacrylate, polyurethane, polystyrene, polycarbonate, polyvinyl chloride, polyethylene terephthalate, silicone, melamine resin, carbon fiber, furan resin, alkyd resin, bismaleimidetriazine resin, ethylene-vinyl acetate copolymer, acrylonitrile-butadiene-styrene copolymer, wood, and rubber (column 6, lines 4-8 and 47-60); **(17)** a surface-modified substrate produced by the process of claim 1 (column 6, lines 4-8); and **(18)** a product comprising a

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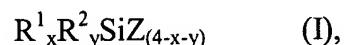
surface-modified substrate produced by the process as claimed in claim 1 (column 6, line 4 through column 7, line 53).

7. Claims 1, 2, 4-9, 12-15, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoneda et al. (US Pat. No. 5,576,109).

Regarding claims 1, 2, 4-6, 8, 9, 12-15, 17, and 18, Yoneda et al. disclose: *(1)* a process for modifying the surface of an organofunctional substrate comprising reacting an organofunctional group of a silicon compound A with the surface of an organofunctional substrate to form a polar treated surface (column 20, lines 17-25; column 22, lines 24-53), wherein the silicon compound A comprises at least one organofunctional group at one end and at least one chloro, alkoxy, carboxy or hydroxyl group, and further wherein said silicon compound A may react to form a polymer bearing silyl groups (column 22, lines 24-53); then applying to the polar treated surface an organofunctional silicon compound B (column 20, lines 17-25; column 2, lines 34-49), wherein the silicon compound A and B may be identical or different, the silicon compound B bears at least one chloro, alkoxy, carboxy, or hydroxyl group, and the silicon compound B reacts with the polar treated surface (column 2, lines 34-49); *(2)* wherein the silicon compound A is crosslinked with itself (column 30, lines 3-12); *(4)* wherein the organofunctional group of the silicon compound A is linear, branched or cyclic alkyl group having from 1 to 20 carbon atoms and may optionally be substituted with a halogen or an alkenyl group having from 2 to 16 carbon atoms (column 22, lines 24-53); *(5)* wherein the organofunctional group of silicon compound A is reacted with the surface of the organofunctional substrate by the addition of an acid or base, in the presence of a solvent, in the presence of a free radical generator or combinations thereof (column 22, lines 7-16); *(6)* wherein

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the acid or base is selected from the group consisting of HCL, HNO₃, HCOOH, CH₃COOH, H₃PO₄, H₂SO₄, an amine, Na₂CO₃, NaOH, NH₄Cl, CH₃COONa, and CH₃COONH₄ (column 22, lines 7-16); (8) wherein the method used to apply the silicon compound B is selected from the group consisting of spraying, dipping, drenching, brushing, polishing, rolling, doctoring, CVD, and PVD (column 19, lines 29-37); (9) further comprising heat treating the organofunctional substrate after reacting the organofunctional group of the silicon compound A with the surface of the organofunctional substrate, after applying the organofunctional silicon compound B to the polar treated surface, or both (column 30, lines 3-12); (12) further comprising precleaning the organofunctional substrate by treating said organofunctional substrate with at least one acidic aqueous solution, basic aqueous solution, acid alcoholic solution or basic alcoholic solution (column 29, lines 55-61); (13) wherein one or both of the silicon compounds A and B is an organosilane of the general formula I



wherein the groups R¹ and R² are identical or different, and each is linear, branched, or cyclic alkyl group having from 1 to 20 carbon atoms, or ω-chloroalkyl, ω-bromoalkyl, ω-azidoalkyl, ω-cyanoalkyl, ω-isocyanatoalkyl, fluoroalkyl, perfluoroalkyl, alkenyl, aryl, ω-acryloxyalkyl, ω-methacryloxy alkyl, sulfane, ω-mercaptoalkyl, sulfoxyalkyl, ω-thiocyanatoalkyl, ω-glycidylalkoxyalkyl, epoxy alkyl, alkenyloxyalkyl, alkoxyalkyl, hydroxyalkyl, aminoalkyl, carbonatoalkyl, or a ureidoalkyl group, wherein each alkylene group contains from 1 to 6 carbon atoms, Z is chloro, a methoxy, ethoxy, isopropyl, 2-methoxyethoxy or acetoxy group, and x is 1, 2, or 3, and y is 0, 1, or 2, and (x+y) ≤ 3, or an organosiloxane based on at least one organosilane of the general formula 1, or a mixture of said organofunctional compound (column 2, lines 34-

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49; column 22, lines 24-52); (14) wherein one or both of silicon compounds A and B is present in monomeric, oligomeric, cocondensed, dissolved, emulsified, or suspended form (column 2, lines 34-49; column 22, lines 24-52); (15) wherein the organofunctional substrate comprises a plastic, a composition, or a natural substance (column 30, lines 23-28); (17) a surface-modified substrate produced by the process of claim 1 (column 31, lines 11-22); and (18) a product comprising a surface-modified substrate produced by the process as claimed in claim 1 (column 30, lines 28-60).

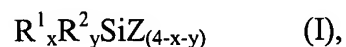
Regarding claim 7, Yoneda et al. do not disclose the use of a free radical generator selected from the group consisting of di-tert-butyl peroxide, dicumyl peroxide, or di-benzoyl peroxide; however, the claim language of claim 7 (and base claim 5) lists the free radical generator as an optional component. Hence, this limitation is anticipated by the prior art.

8. Claims 1, 2, 4-9, and 13-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Ikenaga et al. (US Pat. No. 6,165,619).

Regarding claims 1, 2, 4-6, 8, 9, and 13-19, Ikenaga et al. disclose: (1) a process for modifying the surface of an organofunctional substrate comprising reacting an organofunctional group of a silicon compound A with the surface of an organofunctional substrate to form a polar treated surface (column 2, lines 28-47; column 2, line 52 through column 3, line 33), wherein the silicon compound A comprises at least one organofunctional group at one end and at least one chloro, alkoxy, carboxy or hydroxyl group, and further wherein said silicon compound A may react to form a polymer bearing silyl groups (column 2, lines 52-67); then applying to the polar treated surface an organofunctional silicon compound B (column 2, lines 28-49; column 2, lines 34-56), wherein the silicon compound A and B may be identical or different, the silicon

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compound B bears at least one chloro, alkoxy, carboxy, or hydroxyl group, and the silicon compound B reacts with the polar treated surface (column 2, lines 52-67); (2) wherein the silicon compound A is crosslinked with itself (column 2, lines 39-40); (4) wherein the organofunctional group of the silicon compound A is linear, branched or cyclic alkyl group having from 1 to 20 carbon atoms and may optionally be substituted with a halogen or an alkenyl group having from 2 to 16 carbon atoms (column 2, lines 52-67; column 7, line 63-15); (5) wherein the organofunctional group of silicon compound A is reacted with the surface of the organofunctional substrate by the addition of an acid or base, in the presence of a solvent, in the presence of a free radical generator or combinations thereof (column 9, lines 59-67); (6) wherein the acid or base is selected from the group consisting of HCL, HNO₃, HCOOH, CH₃COOH, H₃PO₄, H₂SO₄, an amine, Na₂CO₃, NaOH, NH₄Cl, CH₃COONa, and CH₃COONH₄ (column 9, lines 59-67); (8) wherein the method used to apply the silicon compound B is selected from the group consisting of spraying, dipping, drenching, brushing, polishing, rolling, doctoring, CVD, and PVD (column 16, lines 6-10); (9) further comprising heat treating the organofunctional substrate after reacting the organofunctional group of the silicon compound A with the surface of the organofunctional substrate, after applying the organofunctional silicon compound B to the polar treated surface, or both (column 16, lines 11-19); (13) wherein one or both of the silicon compounds A and B is an organosilane of the general formula I



wherein the groups R¹ and R² are identical or different, and each is linear, branched, or cyclic alkyl group having from 1 to 20 carbon atoms, or ω-chloroalkyl, ω-bromoalkyl, ω-azidoalkyl, ω-cyanoalkyl, ω-isocyanatoalkyl, fluoroalkyl, perfluoroalkyl, alkenyl, aryl, ω-acryloxyalkyl, ω-

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methacryloxy alkyl, sulfane, ω -mercaptoalkyl, sulfoxyalkyl, ω -thiocyanatoalkyl, ω -glycidyoxyalkyl, epoxy alkyl, alkenyloxyalkyl, alkoxyalkyl, hydroxyalkyl, aminoalkyl, carbonatoalkyl, or a ureidoalkyl group, wherein each alkylene group contains from 1 to 6 carbon atoms, Z is chloro, a methoxy, ethoxy, isopropyl, 2-methoxyethoxy or acetoxy group, and x is 1, 2, or 3, and y is 0, 1, or 2, and $(x+y) \leq 3$, or an organosiloxane based on at least one organosilane of the general formula 1, or a mixture of said organofunctional compound (column 2, lines 52-67); **(14)** wherein one or both of silicon compounds A and B is present in monomeric, oligomeric, cocondensed, dissolved, emulsified, or suspended form (column 2, lines 52-67); **(15)** wherein the organofunctional substrate comprises a plastic, a composition, or a natural substance (column 18, lines 4-31); **(16)** wherein the organofunctional substrate is selected from the group consisting of polyethylene, polypropylene, polyamide, polyester, polyacrylate, polyurethane, polystyrene, polycarbonate, polyvinyl chloride, polyethylene terephthalate, silicone, melamine resin, carbon fiber, furan resin, alkyd resin, bismaleimidetriazine resin, ethylene-vinyl acetate copolymer, acrylonitrile-butadiene-styrene copolymer, wood, and rubber (column 18, lines 4-31); **(17)** a surface-modified substrate produced by the process of claim 1 (column 18, lines 32-36); **(18)** a product comprising a surface-modified substrate produced by the process as claimed in claim 1 (column 18, lines 32-36); and **(19)** a process for repelling water, oil, dirt, dust, or paint comprising incorporating a substrate obtained by the process as claimed in claim 1 as a coating on an article (column 19, lines 2-12).

Regarding claim 7, Ikenaga et al. do not disclose the use of a free radical generator selected from the group consisting of di-tert-butyl peroxide, dicumyl peroxide, or di-benzoyl

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peroxide; however, the claim language of claim 7 (and base claim 5) lists the free radical generator as an optional component. Hence, this limitation is anticipated by the prior art.

Claim Rejections - 35 USC § 103

9. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikenaga et al. (US Pat. No. 6,165,619).

Regarding claims 10 and 11, Ikenaga et al. disclose the process of heat treating after applying material A and material B (column 2, lines 28-51; column 16, lines 1-19). They are silent regarding the specific conditions of 80 to 120 °C and 0.5 to 2 hours; however, Applicant fails to show criticality for these ranges.

Heating (curing) temperature and time are known result-effective variables. Too low of a temperature and too little time will not yield a sufficiently cured product. Too high of a temperature and too much time may cause degradation of both the substrate and the coating material. It has been found that, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation," – *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Therefore, if not explicitly taught in the reference, then the teaching would have been obvious to one of ordinary skill in the art at the time of the invention.

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoneda et al. (US Pat. No. 5,576,109).

Regarding claims 10, Yoneda et al. disclose the process of heat treating after applying material A at a temperature of 80 to 120 °C (column 30, lines 3-12; column 16, lines 1-19). They

are silent regarding the specific time condition of 0.5 to 2 hours; however, Applicant fails to show criticality for this range.

Heating (curing) time is known result-effective variables. Too little time will not yield a sufficiently cured product. Too much time may cause degradation of both the substrate and the coating material. It has been found that, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation," – *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Therefore, if not explicitly taught in the reference, then the teaching would have been obvious to one of ordinary skill in the art at the time of the invention.

Allowable Subject Matter

11. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach or suggest the process of claim 2, wherein compound A is crosslinked by UV irradiation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Feely whose telephone number is 703-305-0268. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Dawson can be reached on 703-308-2340. The fax phone numbers for the

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organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Michael J. Feely
April 7, 2003

A handwritten signature in cursive script, reading "Robert A. Dawson".

Robert Dawson
Supervisory Patent Examiner
Technology Center 1700